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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/726,794

12/02/2003

Osamu Kobayashi

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EXAMINER

CEHIC, KENAN

ART UNIT

PAPER NUMBER

2416

NOTIFICATION DATE

DELIVERY MODE

09/17/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/726,794	Applicant(s) KOBAYASHI, OSAMU	
	Examiner KENAN CEHIC	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/28/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-13,17-33,37-44 and 48 is/are pending in the application.
- 4a) Of the above claim(s) 42-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-13,17-33,37-41 and 48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

Claim Rejections - 35 USC § 103

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1,2,4-6, 8-13, 17,19-26, 28-33, 37, 39,40, 48 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No. 7,177,329 in view of Enami et al. (US 2004/0221180)

Instant Application 10726794	US Patent # 7,177,329
Claim 1 and similarly claim 48. A packet based display interface arranged to couple a video source device to a video sink device. comprising:	Claims 1,2 Claim 1. A transmission efficient packet based display interface arranged to couple a multimedia source device to a multimedia sink device, comprising: a bi-directional

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<p>a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate;</p> <p>a receiver unit coupled to the sink device; and</p> <p>a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a video data packet stream formed of a number of video data packets based upon the source packet data stream in accordance with a link rate that is independent of the native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the video data packets from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa wherein the linking unit does not include a clock.</p>	<p>auxiliary channel arranged to transfer information between the multimedia source device and the multimedia sink device and vice versa, wherein the information transferred over the auxiliary channel includes a set of packet attributes; and a unidirectional main link arranged to transport multimedia data packets from the multimedia source device to the multimedia sink device each having a multimedia data packet header wherein neither the main link nor the auxiliary channel include separate clock signal lines, and wherein each of the headers is reduced in size over what would otherwise be necessary since the packet attributes are communicated via the auxiliary channel prior to the transmission of the multimedia data packets over the main link and not in the packet headers.</p> <p>Claim 2. A transmission efficient packet based display interface as recited in claim 1, further comprising: a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and wherein the main link has an associated link transmission rate that is independent of the native stream rate.</p>
<p>Claim 2. A packet based display interface as recited in claim 1, wherein the video data packet stream is one of a number of video data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.</p>	<p>Claim 4. A transmission efficient packet based display interface as recited in claim 3, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.</p>
<p>Claim 4. A display interface as recited in claim 1, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry</p>	<p>Claim 5. A transmission efficient packet based display interface as recited in claim 4, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information</p>

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information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.	from the sink device to the source device and a uni-directional forward channel for carrying information from the source device to the sink device in concert with the back channel.
Claim 5. A display interface as recited in claim 2, wherein the main link unit further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate	Claim 6. A transmission efficient packet based display interface as recited in claim 5, wherein the main link further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate
Claim 6 .A display interface as recited in claim 5, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	Claim 7. A transmission efficient packer based display interface as recited in claim 6, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.
Claim 8. A display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to automatically determine when an active sink device is connected to the linking unit.	Claim 8. A transmission efficient packet based display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to automatically determine when an active sink device is connected to the display interface.
Claim 9. A display interface as recited in claim 2, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.	Claim 9. A transmission efficient packet based display interface as recited in claim 1, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.
Claim 10. A display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets information and results of training sessions information.	Claim 10. A transmission efficient packet based display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets information and the results of training sessions information
Claim 11. A display interface as recited in claim 2, wherein the video data packet transfer is an isochronous type transfer that	Claim 11. A transmission efficient packet based display interface as recited in claim 1, wherein the multimedia data packet

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includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.
Claim 12. A display interface as recited in claim 1, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 12. A transmission efficient packet based display interface as recited in claim 1, wherein the main link rate is adjustable in a range that includes 1.0 Gigabits per second (Gbps) to 2.5 Gbps.
Claim 13. A display interface as recited in claim 1, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	Claim 13. A transmission efficient packet based display interface as recited in claim 2, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the data packets and wherein the time stamp is based upon a determination of a number of native stream clocks in 2.sup.20 cycles of link cycle clock frequency period.
Claim 17. A display interface as recited in claim 1 , wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	Claim 16. A transmission efficient packet based display interface as recited in claim 15, wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.
Claim 19. A display interface as recited in claim 1, wherein some of the video data packets include a number of sub-packets.	Claim 17. A transmission efficient packet based display interface as recited in claim 1, wherein some of the multimedia data packets include a number of sub-packets each having an associated sub-packet header.
Claim 20. A display interface as recited in claim 19 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	Claim 18. A transmission efficient packet based display interface as recited in claim 17 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets

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	included in a corresponding video data stream.
Claim 21. A packet based method of coupling a video source device to a video sink device, comprising: providing a source device having a transmitter unit coupled thereto; providing sink device having a receiver unit coupled thereto; receiving a source data stream in accordance with a native stream rate by the transmitter unit; coupling the transmitter unit and the receiver unit by way of a linking unit, wherein the linking unit does not include a clock line; forming a video data packet stream formed of a number of video data packets based upon the source data stream; and transferring the video data packet stream in accordance with a link rate between the transmitter unit and the receiver unit.	See Claims 1,2 above.
Claim 22. A method as recited in claim 21, wherein the video data packet stream is one of a number of video data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.	Claim 4. A transmission efficient packet based display interface as recited in claim 3, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.
Claim 23. providing a unidirectional main link arranged to carry the video data packets from the transmitter unit to the receiver unit; and providing a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa.	See claim 1 above.
Claim 24. A method as recited in claim 23, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel	Claim 5. A transmission efficient packet based display interface as recited in claim 4, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel for

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for carrying information from the source device to the sink device in concert with the back channel.	carrying information from the source device to the sink device in concert with the back channel
Claim 25. a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.	Claim 6. (see above)
Claim 26. wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	See Claim 7 above.
Claim 28. A method as recited in claim 22, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream	See claim 8 above.
Claim 29. A method as recited in claim 22, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream	See claim 9 above.
Claim 30. A method as recited in claim 21, wherein the information includes sync loss information, dropped packets information and the results of training sessions information.	See claim 10 above.
Claim 31. A method as recited in claim 22, wherein the video data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	See claim 11 above.
Claim 32. A method as recited in claim 21, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 12 above.

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Claim 33. A method as recited in claim 21, wherein the receiver unit includes a timebase recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	See claim 13 above.
Claim 37. A method as recited in claim 21, wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	See claim 16 above.
Claim 39. A method as recited in claim 21, wherein some of the video data packets include a number of sub-packets.	See claim 17 above.
Claim 40. A method as recited in claim 39 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	See claim 18 above.

U.S. Patent No. **7,177,329** is silent about:

For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line.

Enami from the same or similar field of endeavor discloses the following:

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For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. **7,177,329** by using the above recited features, as taught by Enami , in order to provide improved bandwidth / transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15)

2. Claim 7, 18, 27, 38 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,2,13-15 of U.S. Patent No. US 7,177,329 in view of Wolf et al (US 6,914,637 B1).

For claim 7, 18, 27, 38, claims 1,2,13-15 of U.S. Patent No. US 7,177,329 teach the claimed invention as described above.

Furthermore for claim 7 and 27, claims 1,2,13-15 of U.S. Patent No. US 7,177,329 teach , wherein the source data stream is packetized over the respective virtual link (see claim 6).

Patent No. US 7,177,329 does not disclose:

For claim 7 and 27, a mapping definition.

For claim 18 and 38, wherein the number of video,data streams are multiplexed to

form a single data stream suitable for transmission over the linking unit.

Wolf from the same or similar field of endeavor discloses a display
system interface with a mapping features:

For claim 7 and 27, Wolf discloses a mapping definition (see column 21 lines 59-
61 "code word.. .mapped to source data").

For claim 18 and 38, Wolf discloses wherein the number of video data streams
(see Figure 2 "Digivideo" and Figure 8 "Packet 1", "Packet 2.. .") are multiplexed
(see column 29 lines 37-42 "two or more streams.. .time-multiplexer") to form a
single data stream (Figure 8 "Packet 1", "Packet 2.. .") suitable for transmission over
the linking unit (see Figure 2, CHO-CHC and column 29 lines 39-41 "multiplexed..
..one...Channel").

It would have been obvious to one of the ordinary skill in the art at the time of the
invention to modify the system of Patent No. US 7,177,329 by using the features,
as taught by Wolf, in order to a mapping features for a source (see column 21
lines 59-61).

3. Claims 1,2,4-6, 8-13, 17,19-26, 28-33, 37, 39,40, 48 are rejected on the ground of
nonstatutory obviousness-type double patenting as being unpatentable over claims of
U.S. Patent No. 7,068,682 in view of Enami et al. (US 2004/0221180) and Universal Serial
Bus Specification, hereinafter D1

Instant Application	US 7,068,686
Claim 1, and similarly claims 21 and 48	See claims 9 and 10
Claim 2, and similarly 22	See claim 9 and 10
Claim 4, and similarly 24	See claim 14
Claim 5 and similarly 25	See claim 9
Claim 6 and similarly 26	See claim 15
Claim 8 and similarly 28	See claim 16
Claim 9 and similarly 29	See claim 17
Claim 10 and similarly 30	See claim 18
Claim 11 and similarly 31	See claim 19
Claim 12 and similarly 32	See claim 20
Claim 13 and similarly 33	See claim 21
Claim 17 and similarly 37	See claim 22
Claim 19 and similarly 39	See claim 25
Claim 20 and similarly 40	See claim 26

U.S. Patent No. 7,068,682 is silent about:

For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line; no clock line;

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Enami from the same or similar field of endeavor discloses the following:

For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

D1 from the same or similar field of endeavor discloses:

For claims 1, 21 and similarly 48, D1 discloses no clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. 7,068,682 by using the above recited features, as taught by Enami , in order to provide improved bandwidth / transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15) ; in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

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4. Claim 7, 18, 27, 38 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No. US 7,068,682, and Enami et al. (US 2004/0221180), and Universal Serial Bus Specification, hereinafter D1 as applied above, further in view of Wolf et al (US 6,914,637 B1).

For claim 7, 18, 27, 38, claims 1,2,13-15 of U.S. Patent No. US 7,068,682 teach the claimed invention as described above.

Furthermore for claim 7 and 27, claims 1,2,13-15 of U.S. Patent No. US 7,068,682 teach, wherein the source data stream is packetized over the respective virtual link (see claim 9 and 10).

Patent No. US 7,068,682 does not disclose:

For claim 7 and 27, a mapping definition.

For claim 18 and 38, wherein the number of video,data streams are multiplexed to form a single data stream suitable for transmission over the linking unit.

Wolf from the same or similar field of endeavor discloses a display systeminterface with a mapping features:

For claim 7 and 27, Wolf discloses a mapping definition (see column 21 lines 59-61 "code word.. mapped to source data").

For claim 18 and 38, Wolf discloses wherein the number of video data streams (see Figure 2 "Digvideo" and Figure 8 "Packet 1", "Packet 2..") are multiplexed (see column 29 lines 37-42 "two or more streams.. time-multiplexer") to form a single data stream (Figure 8 "Packet 1", "Packet 2..") suitable for transmission over

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the linlung unit (see Figure 2, CHO-CHC and column 29 lines 39-41 "multiplexed..
.one...Channel").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Patent No. US 7,068,682 by using the features, as taught by Wolf, in order to a mapping features for a source (see column 21 lines 59-61).

5. Claims 1, 2, 4-6, 21, 22 24-26, 48 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of U.S. Patent No. 7,487,273 in view of Enami et al. (US 2004/0221180) and Universal Serial Bus Specification, hereinafter D1

Instant Application	US 7,487,273
Claim 1, and similarly claims 21 and 48	See claim 1-3
Claim 2 and similarly 22	See claim 2
Claim 4 and 24	See claim 4
Claim 5 and 25	See claim 5
Claim 6 and 26	See claim 6

U.S. Patent No. 7,487,273 is silent about:

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For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line; no clock line;

Enami from the same or similar field of endeavor discloses the following:

For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

D1 from the same or similar field of endeavor discloses:

For claims 1, 21 and similarly 48, D1 discloses no clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. 7,068,682 by using the above recited features, as taught by Enami , in order to provide improved bandwidth / transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15) ; in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

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6. Claims 1, 2, 4-6, 21, 22 24-26, 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 11/726350 in view of Enami et al. (US 2004/0221180) and Universal Serial Bus Specification, hereinafter D1.

This is a provisional obviousness-type double patenting rejection.

Instant Application	US Application 11/726350
Claim 1, and similarly claims 21 and 48	See claim 1-2
Claim 2 and similarly 2	See claim 3
Claim 4 and 24	See claim 4
Claim 5 and 25	See claim 5
Claim 6 and 26	See claim 6

U.S. Application No. 11/726350 is silent about:

For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line; no clock line;

Enami from the same or similar field of endeavor discloses the following:

For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

D1 from the same or similar field of endeavor discloses:

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For claims 1, 21 and similarly 48, D1 discloses no clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. 7,068,682 by using the above recited features, as taught by Enami , in order to provide improved bandwidth / transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15) ; in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

7. Claims 1, 2, 4-6, 21, 22 24-26, 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 11/726895 in view of Enami et al. (US 2004/0221180) and Universal Serial Bus Specification, hereinafter D1.

This is a provisional obviousness-type double patenting rejection.

Instant Application	US Application 11/726895
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Claim 1, and similarly claims 21 and 48	See claim 1-2
Claim 2 and similarly 22	See claim 3
Claim 4 and 24	See claim 4
Claim 5 and 25	See claim 5
Claim 6 and 26	See claim 6

U.S. Application No. 11/726895 is silent about:

For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line; no clock line;

Enami from the same or similar field of endeavor discloses the following:

For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

D1 from the same or similar field of endeavor discloses:

For claims 1, 21 and similarly 48, D1 discloses no clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. 7,068,682 by using the above recited features, as taught by Enami , in order to provide improved bandwidth /

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transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15) ; in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

8. Claims 1, 2, 4, 8, 12, 21, 22 24, 28, 32 and 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 11/747844 in view of Enami et al. (US 2004/0221180) and Universal Serial Bus Specification, hereinafter D1.

This is a provisional obviousness-type double patenting rejection.

Instant Application	US Application 11/747844
Claim 1, and similarly claims 21 and 48	See claim 1-8 or claim 11-12
Claim 2 and similarly 22	See claim 12
Claim 4 and 24	See claim 1-8
Claim 8 and 28	See claim 10
Claim 12 and 32	See claim 16

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U.S. Application No. 11/747844 is silent about:

For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line; no clock line;

Enami from the same or similar field of endeavor discloses the following:

For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

D1 from the same or similar field of endeavor discloses:

For claims 1, 21 and similarly 48, D1 discloses no clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. 7,068,682 by using the above recited features, as taught by Enami , in order to provide improved bandwidth / transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15) ; in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

Claims 1, 2, 4-6, 21, 22 24-26, 48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 11/776411 in view of Enami et al. (US 2004/0221180) and Universal Serial Bus Specification, hereinafter D1.

This is a provisional obviousness-type double patenting rejection.

Instant Application	US Application 11/776411
Claim 1, and similarly claims 21 and 48	See claim 1
Claim 2 and similarly 22	See claim 2
Claim 4 and 24	See claim 4
Claim 5 and 25	See claim 5
Claim 6 and 26	See claim 6

U.S. Application No. 11/776411 is silent about:

For claims 1, 21, and similarly 48 wherein the main link line is physically separate from the auxiliary channel line; no clock line;

Enami from the same or similar field of endeavor discloses the following:

For claim 1, 21 and similarly 48, Enami discloses wherein the main link line is physically separate from the auxiliary channel line (see fig. 1 and 7; 16, 18; sections 0011-15 "two USB ports...")

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D1 from the same or similar field of endeavor discloses:

For claims 1, 21 and similarly 48, D1 discloses no clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of U.S. Patent No. 7,068,682 by using the above recited features, as taught by Enami , in order to provide improved bandwidth / transfers speeds so that higher bandwidth content (such as high quality video and sound) can be transmitted to a output device, which enhances the users experience (see Enami section 0011-15) ; in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
9. Claims 1,2, 9, 18, 19, 21-23, 29, 38, 39,40 rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Universal Serial Bus Specification, hereinafter D1 and “MPEG-2 Transmission”, hereinafter D2) in view of Universal Serial Bus Specification, hereinafter D1, and Enami et al (US 2004/0221180)

For claim 1, Ooshima discloses A packet based (see section 0032-34 “video and audio signals transferred from the display apparatus...compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”; see D2 pages 1-2 “Elementary Stream...packets...protocol header” and D1 page 36 “message...frame”) display interface arranged to connect (see fig 1; 5a) a source device (see figs 1 and 3; 3) directly to a video display device (see figs 1-3; 2;), comprising:

a transmitter unit (see fig 3; 3, 37) coupled to the video source device (see fig 3; 34, 34a,2) arranged to receive a video source packet data stream (see section 0033-34 “compresses video signals...outputs

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compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”) in accordance with a native stream rate (see section 0023 “communication rate”; section 0052 “transfer rate”); a receiver unit (see fig 2; 18) coupled to the video display device (see figs 1-3; 2;); coupling the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) arranged to transfer a-video data packet stream formed of a number of video data packets based upon the video source packet data stream (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the USB controller...and the USB cable”) ; the native stream rate (see section 0023 “communication rate...12 Mbps”; section 0052) between the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) comprising: a main link (see figs 1, 2 and 3; 5a) arranged to carry the video data packets (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”) from the transmitter unit (see fig 3; 3, 37) to the receiver unit (see fig 2; 18) and a bi-directional channel (see fig 1-3; 5a; section 0023 “USB...transmitting and receiving...bidirectionally) arranged to transfer information between the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) and vice versa (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) wherein the linking unit does not include a clock line ((see D1 page 7 "Non Return to Zero

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Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync)).

For claim 2, 18, 19, 22, 38, 39, Ooshima discloses the video data packet stream see section 0033-34 "compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable"; section 0029-30 "outputs the video signal to the personal computer...mpeg", section 0036; 0056 "MPEG") in accordance with a native stream rate (see section 0023 "communication rate"; section 0052 "transfer rate")

For claim 4 and similarly 24, Zimmerman discloses carry information (see section 0032-34 "compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable"; section 0029 "outputs the video signal to the personal computer...mpeg", 0056 "MPEG") from the video display device (see fig 3; 2) to the video source device (see fig 3; 3); carrying information (see section 0032-34 "compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable"; section 0029 "outputs the video signal to the personal computer...mpeg", 0056 "MPEG") from the video source device (see fig 3; 3) to the video display device (see fig 3; 2)

For claim 9 and 29, Ooshima discloses the display device see figs 1-3; 2;) to provide a displayed image based upon the received data stream see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”).

For claim 21, Ooshima discloses A packet based (see Zimmerman figs 3-4; col 1 line 5-10 “packet-based bust, such as the universal serial bus”; fig 2; col 4 lines 20-28 “USB frames”) method of coupling a video source device (see figs 1 and 3; 3) to a video display device (see figs 1-3; 2;), comprising:

receiving a video data stream (see section 0032-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) in accordance with a native stream rate (see section 0023 “communication rate”; section 0052 “transfer rate”) by the transmitter unit (see fig 3; 3, 37);

packetizing the video data stream (see section 0032-34 “video and audio signals transferred from the display apparatus...compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”; see D2 pages 1-2 “Elementary Stream...packets...protocol header” and D1 page 36 “message...frame”)

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sending the video data packets (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”; see D2 pages 1-2 “Elementary Stream...packets...protocol header” and D1 page 36 “message...frame”) from the video source device (see figs 1 and 3; 3) to the video display device (see figs 1-3; 2;) at

a link rate (see section 0023 “communication rate...12 Mbps”; section 0052)

using a link comprising a

main link see figs 1, 2 and 3; 5a) for transmitting the video data packets (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”; see D2 pages 1-2 “Elementary Stream...packets...protocol header” and D1 page 36 “message...frame”) from the video source device (see figs 1 and 3; 3) to the video sink

device (see figs 1-3; 2;) and a bi-directional channel (see fig 1-3; 5a; section 0023 “USB...transmitting and receiving...bidirectionally) arranged to transfer information between the video source device (see fig 3; 3, 37) and the video sink device (see fig 2; 18) and vice versa (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the

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personal computer...mpeg", 0056 "MPEG") , wherein no channel includes a clock line (see page 7 "Non Return to Zero Invert...Eliminates the need for clock pulses"; see page 132 Figure 7-12, Vbus, D+, D-, GND, page 86 6.3 "two power conductors and two signal conductors; no clock line is used; see page 157 "NRZI...bit stuffing...sync) Ooshima is silent:

For claim 1 and similarly 21, 48, a link rate that is independent of the native stream rate ; a linking unit where two channels lines are physically separate from each other; a unidirectional link and auxiliary channel.

For claim 2 and similarly 22, wherein the data packet stream is one of a number of data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.

For claim 4 and 24, wherein the bi-directional auxiliary channel includes a back channel configured to carry output / received related information from the sink device to the source device.

For claims 5 and 25, forming a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.

For claims 6, and 26, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.

For claim 7 and similarly 27, wherein the source data stream is packetized over the respective virtual link based upon a mapping definition

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For claim 18 and similarly 38, wherein the number of data streams are multiplexed to form a single data stream suitable for transmission over the linking unit.

For claim 19 and 39, wherein some of the data packets include a number of sub-packets

For claim 21, a link rate that is independent of the native stream rate; physically separate bidirectional channel.

For claim 23, providing a unidirectional link arranged to carry data packets; and providing a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa.

Enami from the same field of endeavor discloses the following:

For claim 1 and similarly 21, a linking unit (See fig. 1, 16, 18, 20) where two channels lines are physically separate from each other (See fig. 1, 16, 18, 20; see section 0011-15 “two USB ports...combined to form a single interface”)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima by using the above recited features, as taught by Enami, in order to provide increased transfer speed, thus enabling better transmission of high bandwidth content (such as video and audio) and additionally providing further power to USB devices when more power is needed than one USB connecton can provide (see Enami sections 0011-15)

D1 from the same field of endeavor disclose:

For claim 1 and similarly 21, 48, D1 discloses a link rate that is independent of the native stream rate (see page 66 “different natural frequencies...8kHz microphone...”; page 67 “Sample clock...natural data rate...bus clock...fast sample rates”; see page 85 6.1 “operate at three speeds...480 Mb/s...12 Mb/s...1.5 Mb/s”; pages 73-74 “Adaptive....Feedback...”); bi-directional auxiliary channel (see page 32 figure 5-9 “...default pipe...default control pipe...” page 34, 5.3.11 “USB devices required to implement a default control....uses this default control method...Default control pipe...”; page 36 5.3.2.2 Message pipes...message pipes support the control transfer type...Section 5.5”; 5.3.2 “Default control pipe...”; page 38-39, 5.5.2 “Each USB device is required to implement the Default Control pipe...control transfers are supported via bi-directional flow over message pipes”; page 278 “10.1.2 “out-of-band” AND / OR see page 72-73 Table 5-12 “Asynchronous...Source ...provides implicit feedforward (data stream)...Sink... provides explicit feedback (isochronous pipe)...Asynchronous...5.12.4.1.1...” and a unidirectional main link (see page 44, 5.6.2 “isochronous pipe is a stream pipe....uni-directional...”; page 48 “5.7.2 “interrupt pipe is a stream pipe...always un—directional...”; see page 20 “4.7 “set of uni-directional pipes”).

For claim 2 and similarly 22, D1 discloses wherein the data packet stream is one of a number of data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate (see page 66 “different natural frequencies...8kHz microphone...”; page 67 “Sample clock...natural data rate...bus

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clock...fast sample rates”; see page 85 6.1 “operate at three speeds...480 Mb/s...12 Mb/s....1.5 Mb/s”; pages 73-74 “Adaptive....Feedback...”).

For claim 4 and 24, D1 discloses wherein the bi-directional auxiliary channel includes a back channel configured to carry output / received related information from the sink device to the source device (see page 72-73 Table 5-12 “Sink ...provides explicit feedback (isochronous pipe)...Asynchronous...sink must provide explicit feedback to the host...”).

For claims 5 and 16, D1 discloses forming a number of virtual links each being associated with a particular one of the data streams (see page 32 figure 5-9 "pipe bundle..."; see page 20 “4.7 “set of uni-directional pipes”; page 60 “5.11.1.1 "set of pipes") wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate (see page 269-270 “bandwidth requirement of each endpoint...isochronous...interrupt”; see pages 44-46 “5.65...constant data rate....isochronous pipe.....Isochronous....Bandwidth...”; page 49-51 "5.7.4 "Interrupt...Bandwidth...)

For claims 6, 12, D1 discloses wherein a main link bandwidth (see page 32 figure 5-9 "pipe bundle..."; see page 20 “4.7 “set of uni-directional pipes”; page 60 “5.11.1.1 "set of pipes") is at least equal to an aggregate of the virtual link bandwidths (see page 269-270 “bandwidth requirement of each endpoint...isochronous...interrupt”; see pages 44-46

“5.65...constant data rate...isochronous pipe.....Isochronous....Bandwidth...”; page 49-51 “5.7.4 “Interrupt...Bandwidth...”).

For claim 7 and similarly 27, D1 discloses wherein the source data stream is packetized over the respective virtual link (see page 19 “One message pipe, the Default Control pipe, always exists once a device is powered one...” page 32 figure 5-9 “pipe bundle...default pipe...default control pipe...” page 34, 5.3.11 “USB devices required to implement a default control....uses this default control method...Default control pipe...”; 5.3.2 “Default control pipe...”; page 38-39, 5.5.2 “Each USB device is required to implement the Default Control pipe...additional control pipes...control transfers are supported via bi-directional flow over message pipes”; based upon a mapping definition (see page 278 “10.1.3...continuous...control transfers...”; see page 269-272 “endpoint...Standard Endpoint Descriptor...A feedback endpoint (explicit....needs to be associated with one or more isochronous data endpoints...”; page 33, Figure 5-10, Pipes and Endpoints; page 34 “5.3.2 Pipes...pipe is an association between and endpoint...”; page 72-74 “Asynchronous...data rate feedback...” Table 5-12 “Asynchronous...explicit feedback...adaptive...explicit feedback...5.12.4.1.3....5.12.4.2...Feedback endpoints...bmAttributes...”; page 228-229 8.5.4 and figure 8-38 “Interrupt transaction...return data, NAK or STALL...ACK handshake”; page 206-209 8.4.5 “Handshake packets...response”; see page 43-44 5.5.5 “control transfers...information returned in a handshake...halt condition” AND/OR page 242-244 9.1.1.3 “After the device has been powered...reset...respond...to device and configuration descriptor

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requests and return information...Before a USB device's function may be used...device must be configure...SetConfiguration()....endpoint... 9.2.3 "A USB device must be configured before its functions may be used");

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima and Enami by using the above recited features, as taught by D1, in order to provide transfer of data that has a guaranteed maximum service period, retry of transfer attempts at the next period in a USB system, and guarantee access to the USB bandwidth with bounded latency, guaranteed constant data rate, thus being able to accommodate a wide range of transmission requirements for data (see D1 page 44 5.6; page 58 5.7)

10. Claims 8, 10, 13, 28, 30, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) D1, and Enami et al (US 2004/0221180) as applied above to claim 1/21, further in view of Wolf et al. (US 6,914,637 B1)

For claim 8 and 28, Ooshima, D1, and Enami discloses the claimed invention as described above.

Ooshima, D1, and Enami are silent about:

For claim 8 and 28, a hot plug event detector unit arranged to automatically determine when an active display device is connected to the linking unit

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For claim 10 and 30, the information includes sync loss information, dropped packets information, and the results of training session information.

For claim 13 and 33, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.

Wolf from the same or similar field of endeavor discloses the following features:

For claim 8 and 28, Wolf discloses a hot plug event detector unit arranged to automatically determine

when an active display device is connected to the linking unit (column 2 lines 36-39).

For claim 10 and 30, Wolf discloses the information includes sync loss (glitches, column 77 lines 47-50)

information, dropped packets information (see col 41 line 50 through col 42 through 25 “drops..drops all odd video frames...repetition...indicates to receiver..discarded”), and the results of training session information (see col 43 line 1-30; col 46 lines 1-50).

For claim 13 and 33, Wolf discloses wherein the receiver unit includes a time-base recovery unit (see column 13 lines 12-16) arranged to regenerate (see column 39 lines 65-67) a particular data stream's native rate based upon a time stamp embedded within the main link data packets (see column 8 lines 44-51 and column 13 lines 12-16).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima, D1, and Enami by using the above features, as taught by Wolf, in order to provide the teaching of providing /

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transmitting auxiliary data when the channel is used for its main purpose, thus decreasing inefficient use of bandwidth (see Wolf col 7)

11. Claims 9, 18, 19, 29, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) D1, and Enami et al (US 2004/0221180) as applied above to claim 1/21, further in view of “MPEG-2 Transmission”, hereinafter D2

For claim 9 and 29, Ooshima, D1, and Enami discloses the claimed invention as described above.

For claim 9 and 29, Ooshima discloses the display device see figs 1-3; 2;) to provide a displayed image based upon the received data stream see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”).

Ooshima, D1, and Enami are silent about:

For claim 9 and similarly 29, wherein the information includes display timing information used by the device

For claim 18 and similarly 38, number of video streams are multiplexed to form a single data stream suitable for transmission over the linking unit

For claim 19 and similarly 39, wherein some of the video data packets include a number of sub-packets.

D2 from the same or similar field of endeavor discloses the following:

For claim 9 and similarly 29, D2 discloses wherein the information includes display timing information used by the device (see pages 1-9 “Presentation time stamp...clock reference...time stamp...clock”)

For claim 18 and similarly 38, D2 discloses number of video streams are multiplexed to form a single data stream suitable for transmission over the linking unit (see pages 1-9 “multiplexed...multiplexing...multiplex”)

For claim 19 and similarly 39, D2 discloses wherein some of the video data packets include a number of sub-packets (see pages 1-9 “MPEG-2 multiplexin...packets...fixed sized transport packets”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima, D1, and Enami by using the above recited features, as taught by D2, in order to provide a data structure for video/audio transmission which enables scrambling, copyright information and information to correctly / securely process and output audio/video to the user properly and without adverse effects of transmission (see D2 pages 1-2);

12. Claims 11, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) D1, and Enami et al (US 2004/0221180) as applied above to claim 1/21, further in view of Wolf et al. (US 6,914,637 B1) and Klingman (US 6,219,736)

For claim 11 and 31, Ooshima, D1, and Enami disclose all the claimed invention above.

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For claim 11 and 31, D1 discloses isochronous type transfer (see page 269-270

“bandwidth requirement of each endpoint...isochronous...interrupt”; see pages 44-46

“5.65...constant data rate...isochronous pipe.....Isochronous....Bandwidth...”; page

49-51 "5.7.4 "Interrupt...Bandwidth...) for video / graphics and audio (see D1, page 13

“Isochronous...audio, video”)

Ooshima, D1, and Enami are silent about:

For claim 11 and 31, multichannel audio; wherein the information transfer is an asynchronous transfer

Wolf from the same or similar field of endeavor discloses the following features:

For claim 11 and 31, Wolf discloses multichannel audio stream (see col 11 lines 47-58 reference, paying particular attention to use of same time base).

Klingman from the same or similar field of endeavor discloses the following features:

For claim 11 and 31, Klingman discloses wherein the information transfer is an asynchronous transfer (see col 17 lines 30-60 “transactions are...asynchronous...SETUP transactions...CONTROL PIPE”)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima, D1, and Enami by using the above recited features, as taught by Klingman and Wolf, in order to provide the teaching of providing / transmitting auxiliary data when the channel is used for its main purpose, thus decreasing inefficient use of bandwidth (see Wolf col 7); in order to provide an inexpensive device to interface peripheral devices, of various different types, such as

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currently-available microcontrollers, with a host through the USB or other bus devices while taking advantage of the high speed of the bus device (see Klingman col 6)

13. Claims 12 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) D1, and Enami et al (US 2004/0221180) as applied above to claim 1/21, further in view of Yin (US 2008/0175277)

`For claim 12 and 32 Ooshima, D1, and Enami discloses the claimed invention as described above.

`For claim 12 and 32, D1 discloses link rate is adjustable (see page 66 “different natural frequencies...8kHz microphone...”; page 67 “Sample clock...natural data rate...bus clock...fast sample rates”; see page 85 6.1 “operate at three speeds...480 Mb/s...12 Mb/s....1.5 Mb/s”; pages 73-74 “Adaptive....Feedback...”)

Ooshima, D1, and Enami are silent about:

For claim 12 and 32, in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.

Yin from the same or similar field of endeavor discloses the following features:

For claim 12 and 32, Yin discloses in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps (see section 0010 “bit rate of 2.5...gbps”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima, D1, and Enami by using the above recited features, as taught by Yin, in order to provide operating speed that can

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provide the desired performance needed to achieve the bandwidth needed to provide the needed quality of service.

14. Claim 20 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) D1, and Enami et al (US 2004/0221180) , and “MPEG-2 Transmission”, hereinafter D2 as applied above to claim 19/39 above, in view of Roberts (4,796,203):

For claim 20 and 40, Ooshima, D1, Enami, and D2 teach all of the claimed invention as described in claim 19, additionally Ooshima and Zimmerman teaches to transmit a displaying image (see Ooshima section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”); of sub-packets (see D2 pages 1-9 “MPEG-2 multiplexin...packets...fixed sized transport packets”).

included in a corresponding video data stream (see Ooshima section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”) Wolf does not teach a refresh unit that selectively updates portions of images that need to be update. Roberts from the same or similar field of endeavor teaches a selective refresh unit (see Figure 1, “Interface 10”) included in the sink device (see figure 1, reference sign 12, “Monitor”) that updates only a portion of a displayed graphics image for every video frame (see column 5 lines 50-60, only

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new image information are used) based upon a number of image coordinates corresponding to the updated portion of the displayed image (see column 5 lines 61-64, only new image information is updated). Thus it would have been obvious for a person of ordinary skill in the art the invention was made to combine the selective refresh interface as taught by Roberts into the video transmission system as taught by Ooshima, D1, Enami, and D2. One could have easily implemented the circuit that Roberts presents in Figure 1 into the transmitter device as taught by Ooshima, (in combination with D1, Enami, and D2. One could have added this circuit and especially the refresh memory as the first circuitry into the transmitter, so that it receives the video signal from the source device (MPEG / harddrive of Ooshima). The motivation is if this circuitry is build in, image portions that do not change need not be updated and thus this redundant information does not need to be transmitted over the link. This obviously saves link bandwidth.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENAN CEHIC whose telephone number is (571)270-3120.

The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KWANG BIN YAO can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Kenan Cehic/
Examiner, Art Unit 2416